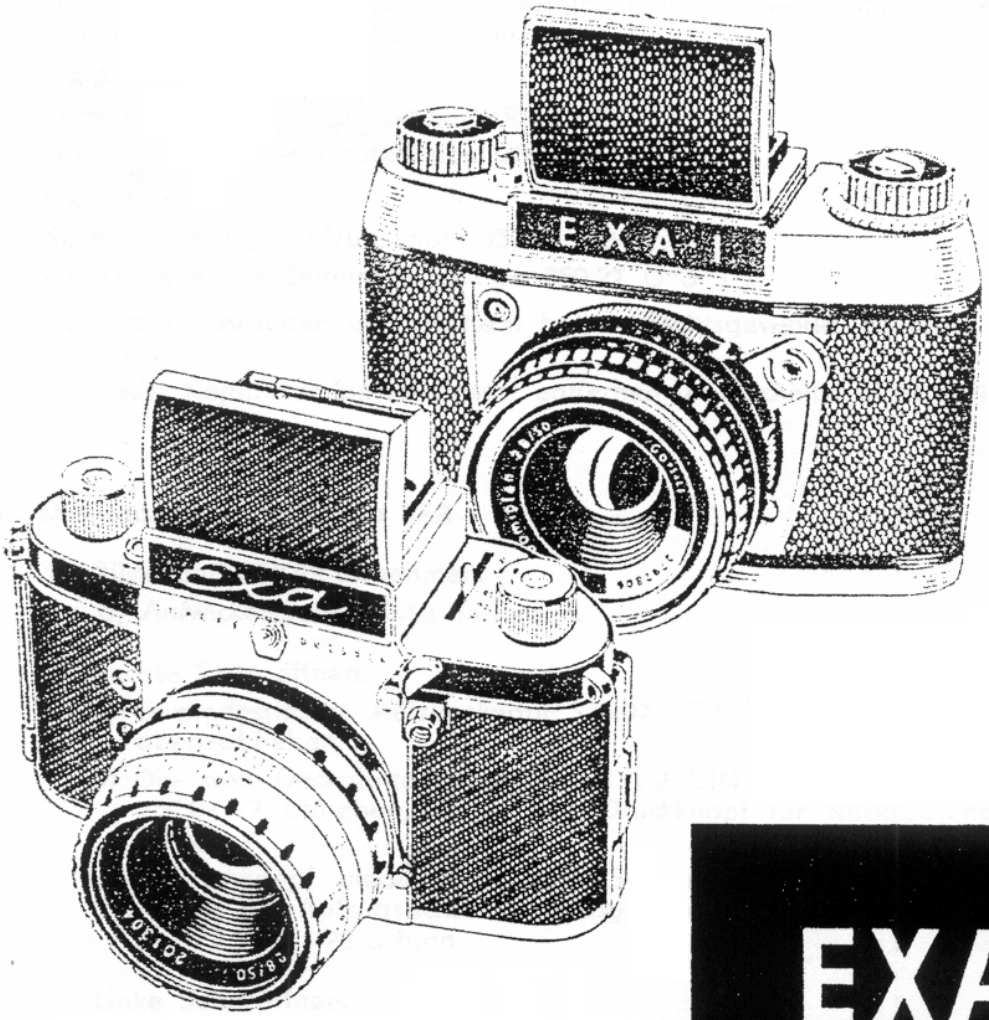

EXA·I

EXA

Repair Manual

[Translated from the German Ihagee manual with the aid of QuickDic 7.2 (www.quickdic.de). Notes in square brackets are mine – Steve Sheppard.]

EXA, EXA I Repair Manual.

Basic Remarks:

The camera under repair is placed with the lens mount 350.09 to the front, i.e. in the photograph taking direction.

EXA

Right: Side with wind knob 350.07-23.

Left: Side with time setting lever 350.04 U 3.

EXA I/63

Right: Side with wind knob 350.17-24.

Left: Side with time setting disc 350.21 U 3.

All screws and nuts have right-hand threads. Never use force!

Before every repair remove the viewfinder (Do not touch the ground-glass screen).

A. Disassembly of EXA camera.

1. Remove the back 350.02

a) Withdraw the take-up spool 350.10.

2. Right side open.

a) Slacken the grub-screw in the wind knob 350.07-23, and withdraw the wind knob upwards.

b) Remove the two top-plate screws M1.2 DIN 91, take off the right top-plate 350.01-7, and the rewind release button 350.01-6.

c) Refit the wind-knob. The grub-screw must be firmly tightened on the milled face of the spindle. Take notice of the ratchet pawl 350.07-22 for the frame counter.

3. Left side open.

(This disassembly is not necessary to dismantle the inner parts.)

a) Remove the two top-plate screws M1.2 DIN 91.

b) Slacken the grub-screw in the wind knob 350.07-23, and withdraw the wind knob upwards. Withdraw the rewind spindle 350.12-6 from below.

c) Take off the left top-plate 350.03-7.

d) Refit the rewind knob. Tighten the grub-screw firmly on to the milled face of the rewind spindle.

4. Mechanism removal.

a) Cock the shutter.

b) Place the camera front upwards.

c) Remove the four fixing screws M1.7 x 6.5 DIN 91 from the lens flange 350.09, and remove the flange (noting any shims 300.21-52/1).

d) Remove the shutter inhibit lever 300.21-46, the screws M1.2 for the front-plate, and the front-plate 350.11 U1 (or 350.11 U3).

e) Remove the fixing screw M1.7 x 4 DIN 63 for the inner mechanism (in the milled area for the lens flange).

f) Place the camera back side uppermost.

g) Remove the inner-mechanism fixing screws M1.7 x 4 DIN 85 in both cassette chambers.

h) Place the camera upright.

i) Remove drive-pinion 350.01-9 from sprocket spindle 350.01-4.

j) Set shutter speed lever 350.04 U 3 to B, and extract the inner mechanism from the outer housing. Do not touch the mirror.

AA. Disassembly of EXA 1/63 camera.

1. Remove the back 370.20.

a) Withdraw the take-up spool 370.09.

2. Removal of top-plate 350.21 U1.

a) Remove screw 350.21-24, bush 350.17-25 for frame-counter disc, frame-counter disc 350.17 U5, and spring-washer 350.17-27. Withdraw wind knob 350.17-24, pushing against the end of the wind bush 350.17 U4 with two flats [Zweikant].

b) Withdraw the spool-retaining spring 300.15 U 12 from the rewind bush. Unscrew the rewind bush [remove the screw] (pay attention to compression-spring 350.21-29, shim beneath 300.15-34, and distance piece 370.21-21), and pull out the rewind spindle 350.21-20 with rewind-knob 350.21-19.

c) Release circlip 6 DIN 6799, remove spring-washer 370.04-45, and take off time-setting disc 350.21 U 3.

d) Remove the four top-plate fixing screws M1.4 x 3 DIN 91, and take off the top-plate.

e) Refit the time-setting disc with spring-washer and circlip (pay attention to the contact disc 350.22-13 and setting slide on time plate 350.22-U1)[i.e. make sure the pin on time setting disc engages with the paxolin disc and the sliding plate for speed setting below].

f) Refit the wind-knob, spring-washer and frame-counter disc with sleeve and screw (pay attention to rewind latch 350.17-19).

3. Mechanism removal.

a) Cock the shutter.

b) Place the camera front side upwards.

c) Remove the four fixing screws M1.7 x 6 DIN 63 for the lens-flange 350.09, and take off the lens-flange (noting any shims 300.21-52/1).

d) Remove the mechanism fixing screw M1.7 x 4 DIN 63 (in the milled area for the lens flange).

e) Place the camera with the back side upwards.

f) Remove the inner mechanism fixing screws M1.7 x 4 DIN 84 in both cassette chambers.

g) Extract the inner mechanism from the outer housing. Do not touch the mirror.

B. EXA assembly.

1. Mechanism insertion.

As under disassembly of camera A.4, but in reverse order. Check for correct functioning.

2. Close left side.

As under disassembly of camera A.3, but in reverse order. Check for correct functioning.

3. Close right side.

As under disassembly of camera A.2, but in reverse order. Check for correct functioning.

4. Check and adjust the distance between the lens mount and the film plane.

Check along the film-path with a Meßuhr [means dial-gauge - should be depth-gauge, surely?]. The distance between the lens-mount and the film-guides must be 44.72 ± 0.01mm. The film-path should be set accordingly [presumably by means of shims under the mount. There is no way of setting the film-path itself].

5. Check and adjust the mirror position.

(Collimator is set to infinity).

a) Example 1:

The greatest sharpness lies before the infinity stop of the lens: hold the mirror retaining spring 300.23 U 5 with the mirror hook (see diagram Fig. 1). Bend the chamfered rivet on the mirror retaining spring downwards, until the greatest sharpness is obtained at the infinity mark of the lens.

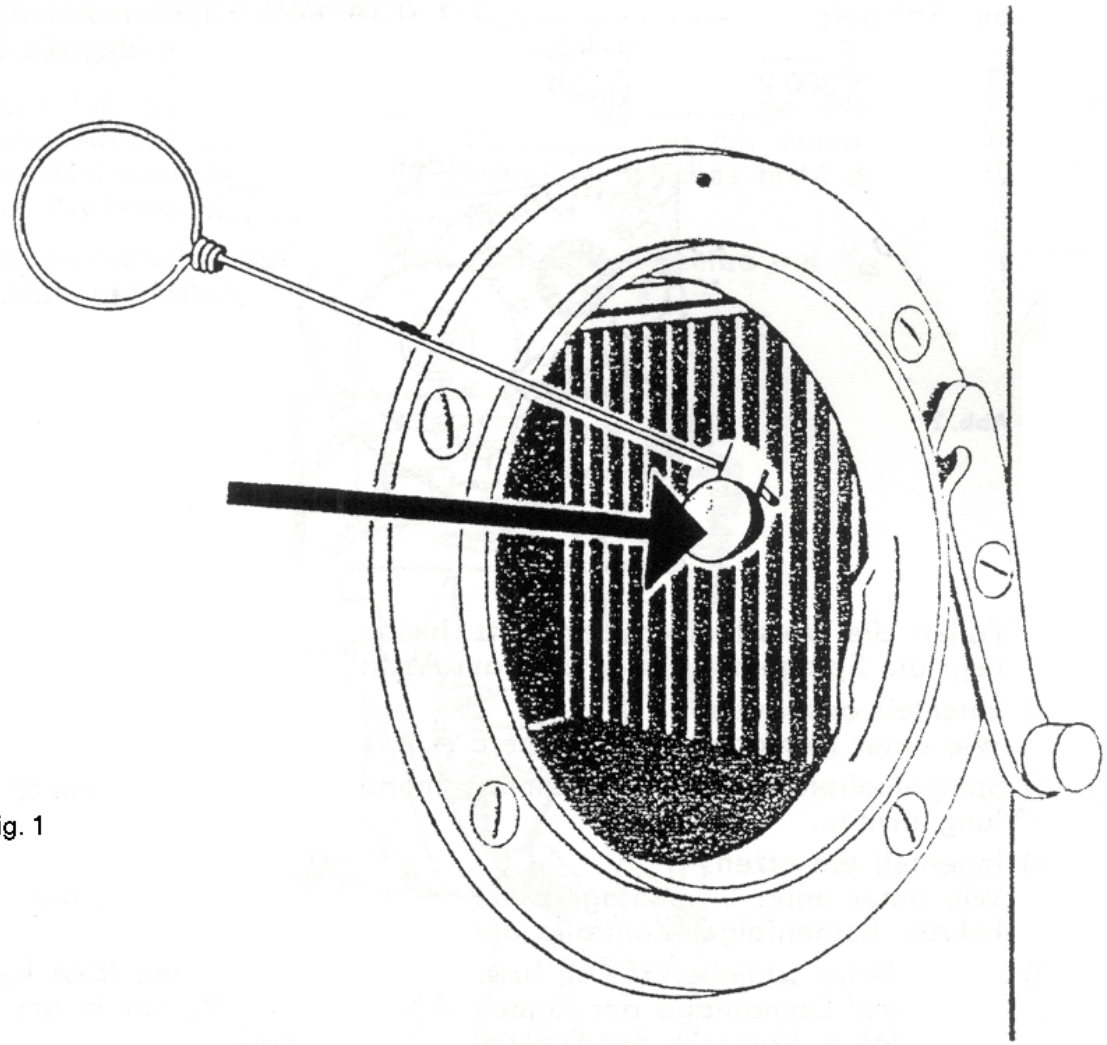

Fig. 1

b) Example 2:

The greatest sharpness is not yet obtained at the infinity stop of the lens (i.e. the point of sharpest focus would lie beyond the infinity stop): hook the mirror retaining spring (with a screwdriver or knife) behind the chamfered rivet and bend it into the mirror chamber until the greatest sharpness is obtained at the infinity mark on the lens.

BB. Assembly of camera EXA I/63.

1. Mechanism insertion.
As under disassembly of camera AA.3, but in reverse order. Check for correct functioning.

2. Top-plate 350.21 U 1 fitting.
As under disassembly of camera AA.2, but in reverse order. Check for correct functioning.

3. Check and adjust the distance between the lens mount and the film plane.
As under assembly of camera B.4.

4. Check and adjust the mirror position.
As under assembly of camera B.5.

C. Elimination of certain faults.

1. Shutter flap 350.04 U 5 falls back. [i.e. mirror is not caught by retaining spring]

a) Open right side (EXA) or remove top-plate 350.21 U 1 (EXA I/63).
As under camera disassembly A.2 or AA.2.

b) Bend apart the adjustable slot on the mirror cocking lever 350.04 U 2 (EXA), 350.04 U 7 (EXA I/63), see Fig. 2, until cocking stroke suffices and shutter flap goes past the retaining spring 300.23 U 5 by about 0.5mm.

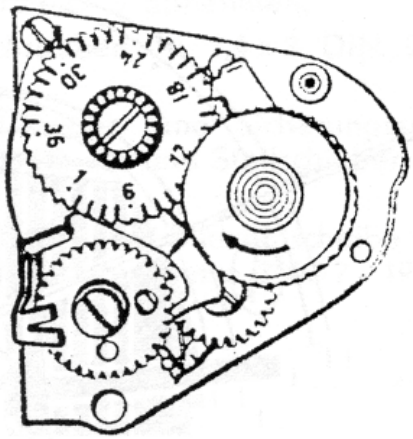

Fig. 2

If the shutter flap falls back despite the adjustment of step b), then the mirror retaining spring does not lie correctly in place in contact with the shutter release lever 350.04-8.

c) Remove the mechanism.
As under camera disassembly A.4 or AA.3.

d) Give the mirror retaining spring a bias [i.e. bend it down], being mindful of the mirror setting.

e) Replace the mechanism.
As under disassembly of camera A.4 or AA.3, but in reverse order. Check for correct functioning.

f) Close right side (EXA) or replace top-plate (EXA I/63).
As under disassembly of camera A.2 or AA.2, but in reverse order. Check for correct functioning.

g) Check and adjust the distance between the lens mount and the film plane.
As under assembly of camera B.4.

h) Check and adjust the mirror position.
As under assembly of camera B.5.

2. Shutter does not engage (Shutter flap 350.04 U 5 runs closed) [i.e. second part of shutter does not catch and runs with mirror]

Dismantle camera, as under Disassembly of Camera A.1 - A.4, or AA.1 - AA.3, and do as described in Elimination of certain faults C.1 - Shutter flap falls back.

a) Verify the functioning of all the shutter levers together (i.e. levers must slide well and mirror retaining spring must rest against the release lever 350.04-8). If Point a) is ensured, without the fault being rectified, the shutter must be adjusted and/or readjusted.

b) Set the timing lever 350.04 U 3 (EXA) or 350.21 U 3 (EXAI/63) to B. Cock the shutter.

c) Restraining the first shutter flap with a finger, fire the shutter and let the first shutter flap run slowly. Do not grasp the mirror. The release of the first shutter flap must occur about 2mm before the shutter release lever stop. The release point is varied by the bend at the adjustment slot in the shutter release lever.

d) Allowing the shutter release lever to move slowly outwards, the release of the second part of the shutter flap must occur about 2mm before the edge of the plate [the plate above?]. The release point is adjusted by bending the release nose of the shutter release lever [the lower end].

e) Cock the shutter.

f) Release the shutter and pay attention to the second shutter flap. This must move in the direction of the first shutter flap by about one millimetre before being stopped by release lever 350.04-12 [the one at the bottom corner]. If this does not occur, the release lever must be corrected [gerichtet] [i.e. bend the part turned inwards?].

g) Set the exposure time lever to 1/50 sec or 1/60 sec. Cock the shutter.

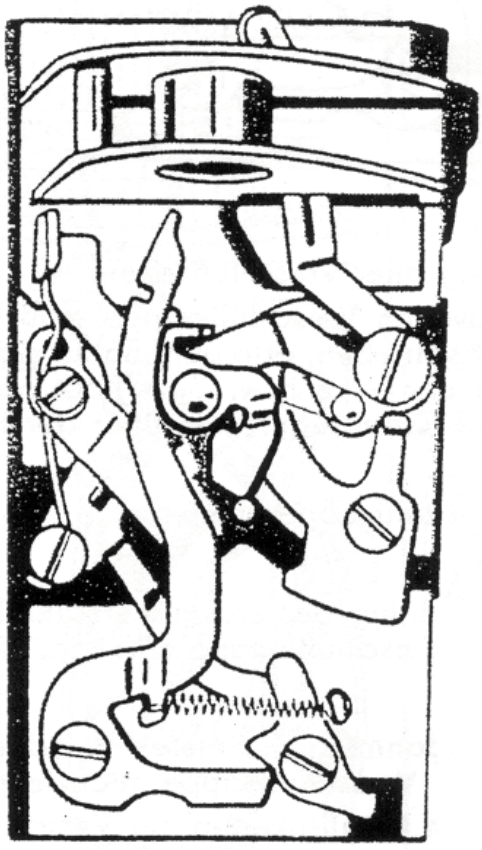

Fig. 3

h) Holding the first shutter flap with a finger, fire the shutter and let the first shutter flap run slowly, the release pin for the first shutter flap (see Fig.3) must now run towards the point on the secondary lever on the exposure time lever. If this does not occur, the Anschlag [?tab/stop?] on the secondary lever must be adjusted.

i) Set the exposure time lever to 1/150 sec or 1/175 sec. Cock the shutter.

j) Holding the first shutter flap with a finger, fire the shutter and let the first shutter flap run slowly. The release pin for the shutter flap (see Fig.4), must now release the second shutter flap in the indicated position. If this does not occur, the trip lever 350.04-13 [the long vertical lever] must be bent at its lower end.

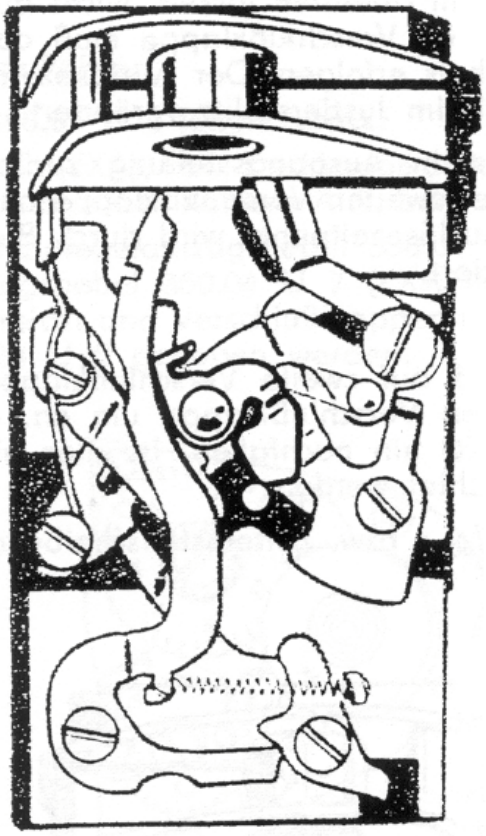

Fig. 4

k) Control of the release at all shutter speeds.
The release of the second shutter flap must occur as described in Point j) at all shutter speeds. If readjustment at the 1/50 sec (or 1/60 sec) or 1/25 sec (or 1/30 sec) should still be necessary, then this is to be made at the curve of the trip lever over the half-round recess.

l) Check the shutter with a shutter time measuring device.

Example 1:
Shutter too light: Reduce the tension of the first shutter flap, or increase the tension of the second shutter flap. [HOW??????????????????????????????????]

Example 2:
Shutter too dark: Increase the tension of the first shutter flap, or reduce the tension of the second shutter flap. [HOW??????????????????????????????????]

The options of the shutter time adjustment stated under l) are used alternatively by the camera mechanic.

3. Mirror 300.21-53 replacement.

a) Remove the back 350.02 (EXA) or 370.20 (EXA I/63).

b) Place the camera front uppermost.

c) Remove the four lens-mount fixing screws M1.7 x 6.5 DIN 91 (EXA) or M1.7 x 6 DIN 63 (EXA I/63). Remove the lens-mount (noting any shims 300.21-52/1).

d) Guide the front edge of the shutter flap to the level of the gap in the round opening in the outer casing. Bend outwards both the retaining tabs (left and right) for the mirror.

e) Slide the mirror out.

f) Insert the new mirror and bend the retaining tabs back inwards.

g) Replace the lens mount.

h) Check/adjust the lens mount to film path distance.

See under assembly of camera B4.

i) Check/adjust the mirror position.

See under assembly of camera B5.

4. Frame-counter failure.

EXA

a) Open right side, described in Disassembly of Camera A.2.

b) Cock and fire the shutter, observing the spring for the ratchet-lever 350.07-17.

c) Bend the spring for the ratchet-lever, near the mounting of the frame-counter disc 350.07-21, so it engages with the teeth.

d) Close the right side. As in Disassembly of Camera A.2, but in reverse order.

e) Check the operation.

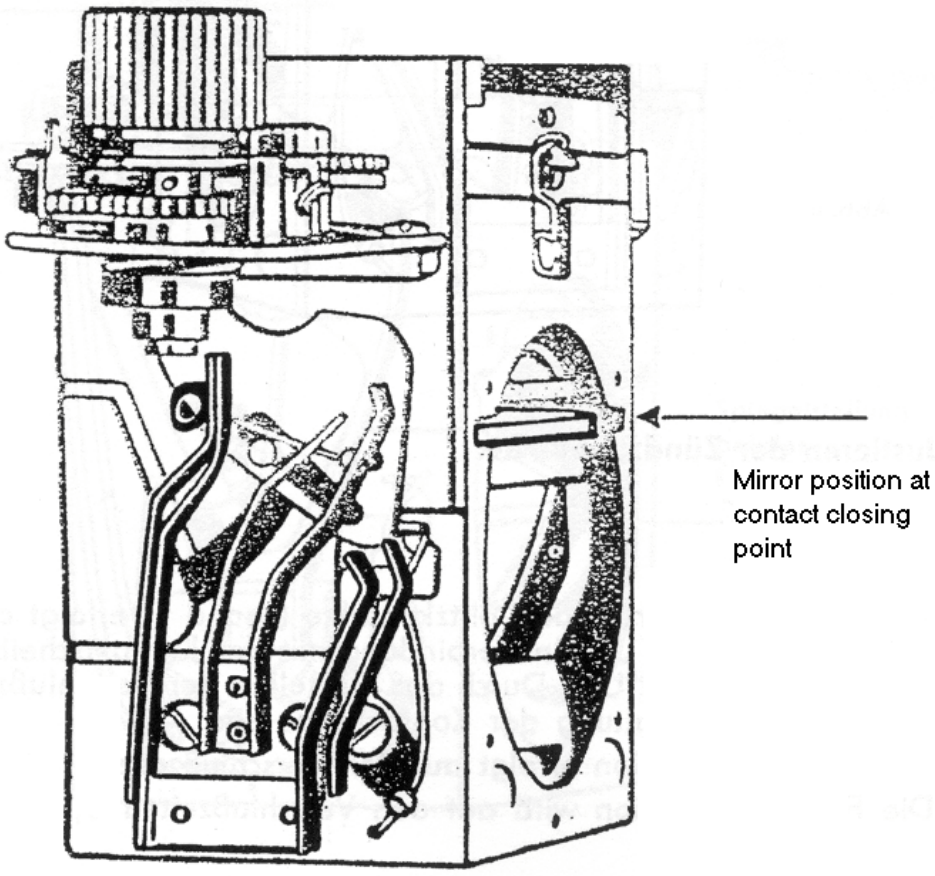

Fig. 5

5. Synchronisation failure.

Adjusting the flash synchronisation.

EXA

Dismantle the camera, as under Camera Disassembly A.1 - A.4.

a) Set the exposure time lever to the 1/25 sec position and cock the shutter.

b) Holding the leading edge of the shutter flap with a finger, fire the shutter and let the leading edge of the shutter flap run slowly. The X-contact must fire near the position shown in Fig. 5, and the F-contact near the position shown in Fig. 6. If they do not do so, the contact spring must be bent at the flash contact accordingly.

c) Reassemble the camera, see Assembly of Camera B.1 - B.5.

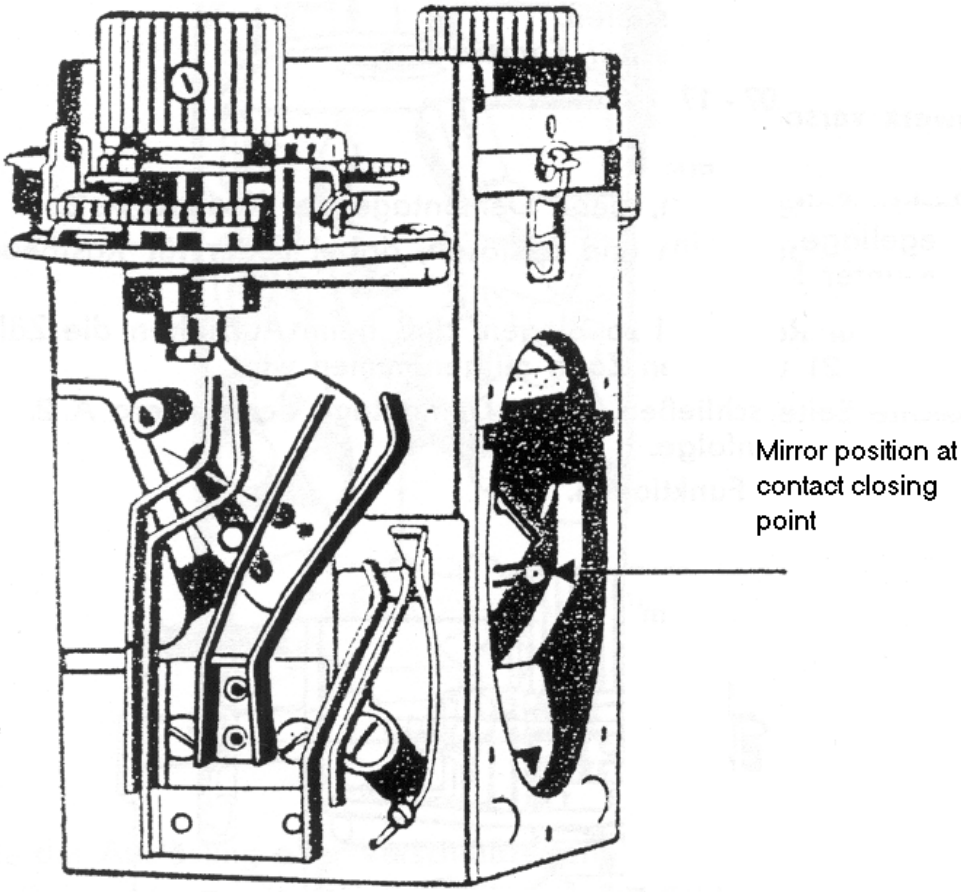

Fig. 6

Adjusting the flash synchronisation.

EXA I/63

Note:

The setting of both flash contacts (X and F) depends on the linkage between the time setting disc 350.21 U 3 and the contact disc 350.22-13 on insulating-part I 350.22 U 4. Because of this, setting the shutter times causes at the same time a changeover of the contacts.

The X-synchronisation takes place at shutter speeds of 1/60 sec and B.

The F-synchronisation will operate at shutter speeds of 1/175 sec, 1/125 sec and 1/30 sec.

Adjusting the insulating-part I. [the insulating block under the time-setting disc]

Dismantle the camera, as under Disassembly of Camera AA.1 - AA.2.

aa) At the F-synchronisation the contact spring of insulating-part I must touch the contact pin (where the connection for the coupling wire 350.22-11 is). If necessary bend the contact spring accordingly.

bb) Replace the top-plate 350.21 U 1, as under assembly of camera BB.1 - BB.2.

Adjusting the insulating-part II. [the block with the flash contacts on the right below the wind mechanism]

Dismantle the camera, as under Disassembly of Camera AA.1 - AA.3. Check the F-contact:

cc) Set the time setting disc to 1/30 sec and cock the shutter.

dd) Restrain the shutter flap, release the shutter and let the shutter flap run slowly; the F-contact must fire as shown in Fig. 7. If this does not occur, the contact spring for insulating-part II must be bent accordingly.

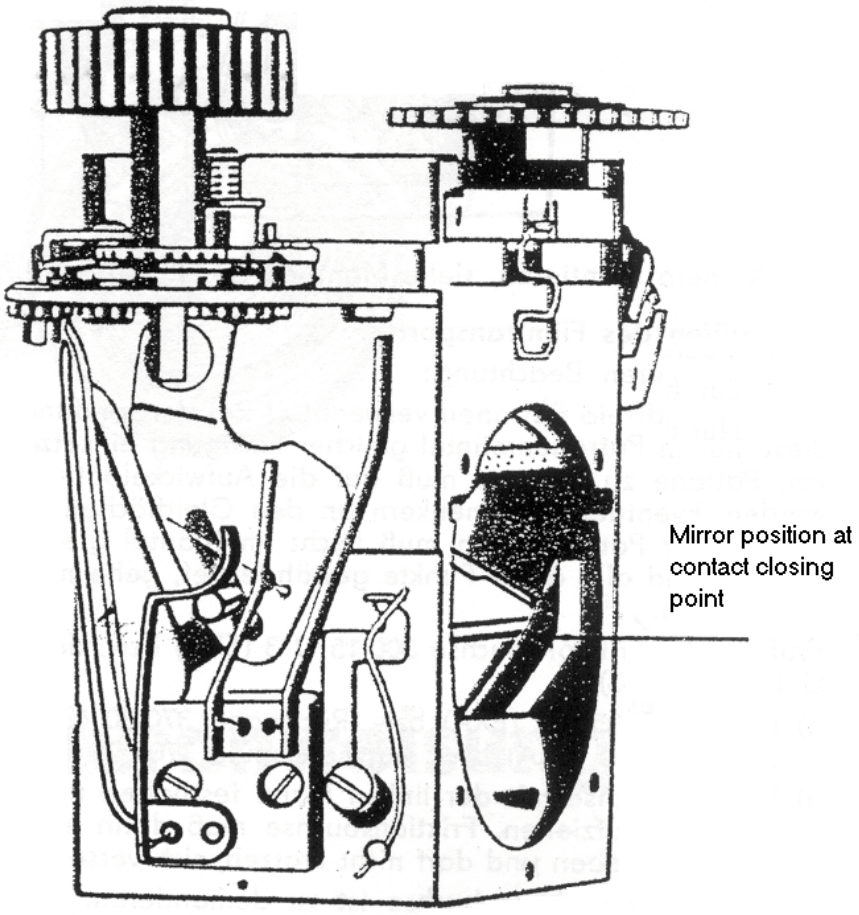

Fig.7

Checking the X-contact.

ee) Set the time setting disc to 1/60 sec and cock the shutter.

ff) Hold [restrain?] the shutter flap, release the shutter and let the shutter flap run slowly; the X-contact must fire as shown in Fig. 8. If this does not occur, the contact spring for insulating-part II must be bent accordingly.

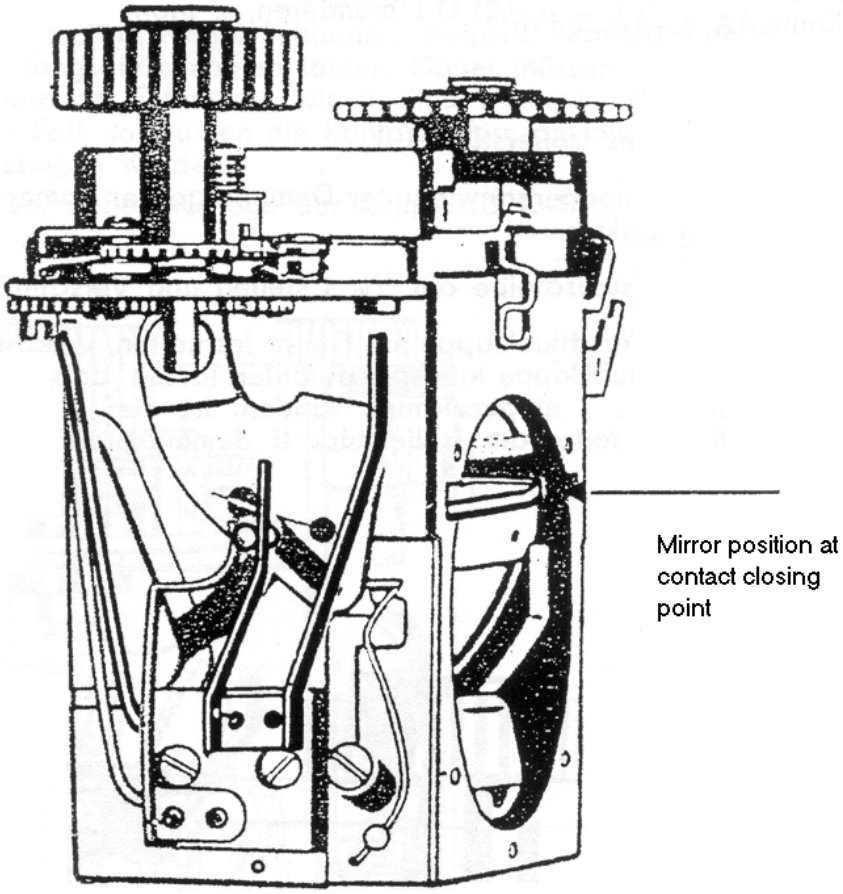

Fig. 8

gg) Reassemble the camera, see Assembly of Camera BB.1 - BB.4.

6. Checking the film transport.

NB. Only use a faultless cartridge! When spools for daylight loading are used, these may only be inserted in cassette cases of the same manufacturer. With film transport from cassette to cassette, special attention must be paid to the wind-on cassette. If necessary the sliding surface of the spool may be lightly rubbed with paraffin. The spool must slide easily into the case and must not be at an angle. All these points being in order, the checking of the camera can begin.

Checking the friction-bush 300.15 U 3 (EXA) or 370.03 U 11 (EXA I/63).

a) Remove the rear cover 350.02 (EXA) or 370.20 (EXA I/63) and the take-up spool 350.10 (EXA) or 370.09 (EXA I/63).

b) Hold the friction bush with the left hand, and at the same time slowly cock the shutter. The friction bush must give uniform resistance and not scrape, catch or run very much out of true.

c) A faulty friction bush is to be removed, cleaned and re-lubricated.

****

EXA·Ia

Repair Manual

EXA Ia Repair Manual.

Basic Remarks:

The camera under repair is placed with the lens mount 300.21 U 6 to the front, i.e. in the photograph taking direction.

Right: Side with wind-lever 750-005.00.

Left: Side with time-setting ring 750-004.00.

All screws and nuts have right-hand threads. Never use force! All screws secured with lacquer are to be so secured on assembly.

A. Disassembly of camera

1. Take off the back cover 370.20.

a) Remove the take-up spool 370.09.

2. Remove the top-plate 750-001.00.

[Note there are 2 types of frame counter – first like Exa IIa – second like Exa IIb]

a) Set the time-setting ring 750-004.00 to B.

b) With the special tool undo the ring cover 370.41-21 [outer metal ring - use friction tool].

c) With the special tongues hold the frame-counter disc 370.41-25 and with the special tool remove the screw 370.41-28 for the frame-counter disc.

d) Withdraw the frame-counter disc, if necessary note any washers.

e) Mark the position of the inter-ring 370.41-20 [the ring retaining the film-speed reminder], and undo the three flat-head [cheese-head?] screws M1.4 x 2 DIN 84.

f) Take off the inter-ring with the film-type ring 370.41-20 and the spring shim 370.41-27.

g) Remove circlip 4 DIN 6799, shim 370.01-79 (as many as present), and the 3 fixing screws M1.4 x 3 DIN 63 for the wind-lever 750-005.00. Withdraw the wind-lever (Note the position of the wind-lever relative to the Schaltsegment 750-709.00 [the turning part on the camera] and the shim 370.41-26).

Note:

With the modified film-type ring [like the Exa IIb] the disassembly is as in the following sequence.

aa) Set the time-setting ring 750-004.00 to B.

bb) Remove glued-in cover disc (black) 750-000.37 (note position of index mark).

cc) With the special tongues hold the frame-counter disc 370.41-25 and with the special key remove the screw 370.41-28 for the frame-counter disc.

dd) Withdraw the frame-counter disc, if necessary note any washers.

ee) Not applicable here.

ff) Not applicable here.

gg) Remove circlip 4 DIN 6799, shim 370.01-79 (as many as present), and the 3 fixing screws M1.4 x 3 DIN 63 for the wind-lever 750-005.00. Withdraw the wind-lever (complete with film-type ring 750-713.02, cover-ring 750-713.01 and spring shim 370.41-27). Note the position of the wind-lever relative to the Schaltsegment 750-709.00[the turning part on the camera] and the shim 750-713.04.

h) Remove the spool-retaining spring 300.15 U 12 from the rewind sleeve 750-000.02, and unscrew the sleeve[centre screw] (pay attention to compression spring 370.01-90, shim 370.01-87/2 and spacer 370.01-69). Pull out the rewind spindle. Take off the disc 750-000.31.

i) Remove the circlip 370.04-48 for the time-setting disc 750-004.00, the spring washer 370.04-45, and take off the time setting disc.

j) Undo the 4 fixing screws 350.21-32 for the top-plate, withdraw the lever for the shutter lock 750-012.00 with shim, and take off the top-plate.

k) Refit the time-setting disc with the spring washer and circlip (pay attention to the contact disc 350.22-13 and setting slide on time plate 750-201.00)[i.e. make sure the pin on time setting disc engages with the paxolin disc and the sliding plate for speed setting below].

l) Refit the wind-lever, complete, with three screws, shim and circlip.

3. Mechanism removal.

See Repair Manual for EXA I/63.

B. Assembly of camera.

1. Mechanism insertion.

See Repair Manual for EXA I/63 AA.3 but in reverse order. Check functioning.

2. Fitting top-plate 750-001.00.

As under disassembly of camera A.2 but in reverse order. Check functioning.

3. Check and adjust the distance between the lens mount and the film plane.

See Repair Manual for EXA B.4.

4. Check and adjust the mirror.

(Collimator is set to infinity.)

a) Example 1:

The greatest sharpness lies before the infinity stop of the lens: Bend upwards the adjustment tab (on the left side of the upper shutter flap), until the sharpest focus is obtained at the infinity stop of the lens.

b) Example 2:

The greatest sharpness is not yet obtained at the infinity stop of the lens (i.e. the point of sharpest focus would lie beyond the infinity stop): Bend downwards the adjustment tab (on the left side of the upper shutter flap), until the sharpest focus is obtained at the infinity stop of the lens.

C. Elimination of certain faults.

1. Shutter flap 750-401.00 falls back.

a) Remove the top-plate 750-001.00. As under disassembly of camera A.2.

b) Bend apart the adjustment slot in the mirror lifting lever 350.04 U 7, until the lift stroke suffices and the shutter flap passes the mirror holding lever 750-400.05 by about 0.5mm.

Should the lift stroke not be sufficient in spite of this adjustment, then check and if necessary replace the Schaltsegment 750-709.00 [the assembly the wind lever fixes to?] and Aufzugsgetreibe 750-704.00 [the lift linkage].

c) Replace the top-plate. See under Disassembly of Camera A.2 but in reverse order. Check functioning.

2. Shutter does not engage (Shutter flap 750-401.00 runs closed) [ie. second part of shutter does not catch and runs with mirror?].

Disassemble camera, as described under Disassembly of Camera A.1 - A.3. For repair method, see Repair Manual for EXA/EXA I C.2.

3. Mirror 300.21-53 replacement.

See Repair Manual for EXA/EXA I C.3.

4. Frame counter failure.

See Repair Manual for EXA IIa C.6.

5. Synchronisation failure.

See Repair Manual for EXA/EXA I C.5. - Adjusting the flash synchronisation EXA I/63.

6. Checking the film transport.

See Repair Manual for EXA/EXA I C.6.

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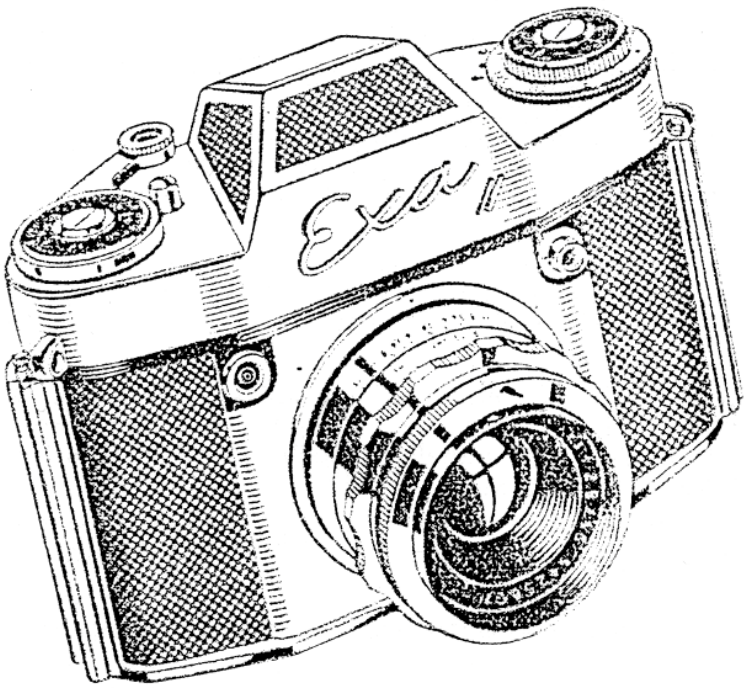
EXA II



Repair Manual

EXA II Repair Manual.

Basic Remarks:

The camera under repair is placed with the lens mount 300.21 U 6 to the front, i.e. in the photograph taking direction.

Right: Side with wind-lever 370.01 U11.

Left: Side with time-setting ring 370.01-67.

All screws and nuts have right-hand threads. Never use force! All screws secured with lacquer are to be so secured on assembly.

A. Disassembly of camera.

1. Take off the back cover 370.10.

a) Remove the take-up spool 370.09.

2. Remove the top-plate 750-001.00.

a) Set the time-setting ring 370.01-67 to ½ sec.

b) Remove screw 370.01-81, frame-counter disc 370.01 U4, and frame-counter knob 370.01-70 (press against the end of the frame-counter shaft with two flats [Zweikant]).

c) Remove circlip 4 DIN 6799, shim 370.01-79 (as many as present), and the three fixing screws M1.4 x 4 DIN 63 for the wind-lever 370.01 U11. Withdraw the wind-lever (Note the position of the wind-lever relative to the pawl carrier 370.01 U8).

d) Remove the spool-retaining spring 300.15 U 12 from the rewind bush 370.01-21, and unscrew the sleeve[centre screw] (pay attention to compression spring 370.01-90, shim 370.01-87/2 and spacer 370.01-69). Pull out the rewind spindle 370.01 U14. [NB. It's not necessary to take out the screw on top holding the film reminder]

e) Remove the circlip 370.04-48 for the time-setting disc 370.01-67, remove shim 370.01-87/1, loosen [it is a snug fit] and remove the time-setting disc from the two flats of bush 370.04 U8 (press against the end [Zweikant] in order that the gear mesh is not changed).

f) Remove the 2 fixing screws M1.4x3 U91 from the top cover.

g) Lift off the top cover and remove rewind button 370.01 U10 with spring 370.01-89.

h) Refit the wind-lever with 3 screws, shim, and circlip.

i) Mark the mesh of the time-setting wheel (gear-wheel on sleeve 370.04 U8) to the gear on the mechanism and refit the time-setting disc.

3. Removal of mechanism 370.03.

a) Remove the 2 screws M1.7x8 DIN 84 in each film chamber.

b) Lift out the mechanism from the body-shell 370.08.

B. Assembly of camera.

1. Insertion of mechanism 370.03.

As under Disassembly of Camera A3 but in reverse order, engaging with the pinion on the sprocket-spindle 370.01-35. Check for correct functioning (including flash contact).

2. Fitting the top-plate 370.01 U2.

As under Disassembly of Camera A2 but in reverse order. Check for correct functioning.

3. Check and adjust the distance between the lens mount and the film plane.

The film-path is checked with a Meßuhr [means dial-gauge - should be depth-gauge, surely?]. The distance between the lens-mount and the film-guides must be 44.72 ± 0.01mm. The film-path should be set accordingly [presumably it means by means of shims under the mount - no way of setting the film-path itself].

4. Check and adjust the mirror position.

(Collimator is set to infinity).

a) Example 1:

The greatest sharpness lies before the infinity stop of the lens: Bend upwards the adjustment tab on the mirror base 370.03 U 13 (see Fig 1) until the greatest sharpness is obtained at the infinity mark of the lens.

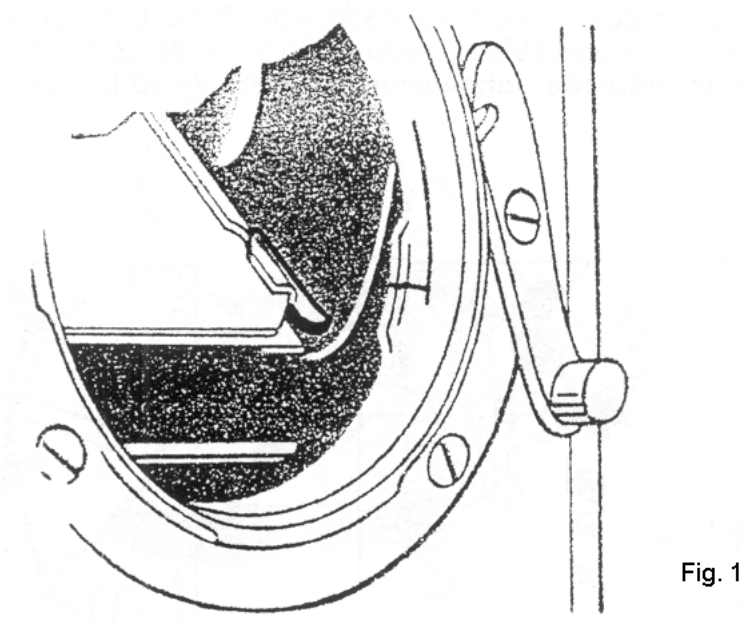


Fig. 1

b) Example 2:

The greatest sharpness is not yet obtained at the infinity stop of the lens (i.e. the point of sharpest focus would lie beyond the infinity stop): Bend downwards the adjustment tab on the mirror base (see Fig 1) until the greatest sharpness is obtained at the infinity mark of the lens.

C. Elimination of certain faults.

[NB. There seem to be two versions of the spring spindles. The illustrations are evidently the earlier version. See the “Notes” for method for the later version.]

1. Cocking fails or is blocked.

Dismantle camera, as under Disassembly of Camera A.1 to A.3.

In the following only the disassembly of the cocking side will be described. The camera mechanic determines which parts must be replaced and/or readjusted. No attention need be paid to the position of the gear wheels relative to each other.

Disassembly of the cocking side:

a) Take off the wind-lever 370.01 U11 and pawl carrier 370.01 U8 (Pay attention to the wind-lever return spring 370.01-110). [The circlip may have formed burrs on the top of its groove. Dress them with a needle file so that the pawl-carrier slides off easily]

b) Remove the locking wheel 370.01 U6 and shims 370.01-87/1. [One above, one below]

c) Remove the circlips 1.5 DIN 6799, the cocking spindle 370.04 U6 and the transport spindle 370.04 U7. Both spindles come out downwards (note shims).

d) Undo the 4 fixing screws 300.21-59 for the intermediate plate 370.04 U4, and lift off the intermediate plate.

Assembly of the cocking side:

As described under C.1.a) to C.1.d) but in reverse order (take care to replace shims).

2. Cocking segment 370.07 U5 is damaged.

Dismantle camera, as under Disassembly of Camera A.1 to A.3.

a) Mark the position of both curtain-rods in the un-cocked condition on the shutter plate (right), and the mesh of the teeth of both pinions 370.03-27 with the shutter wheels, 370.07 U7 and 370.07 U8.

b) Remove the two pinions 370.03_27.

c) Undo and remove all the fixing screws for the right shutter-plate (4 screws) and for the shutter cover-plate 370.03 U14 (1screw) (see Fig2) as well as for the right cover-plate 370.03-24 (3 screws) [inside]. Remove the shutter plate, springing the shutter cover-plate backwards.

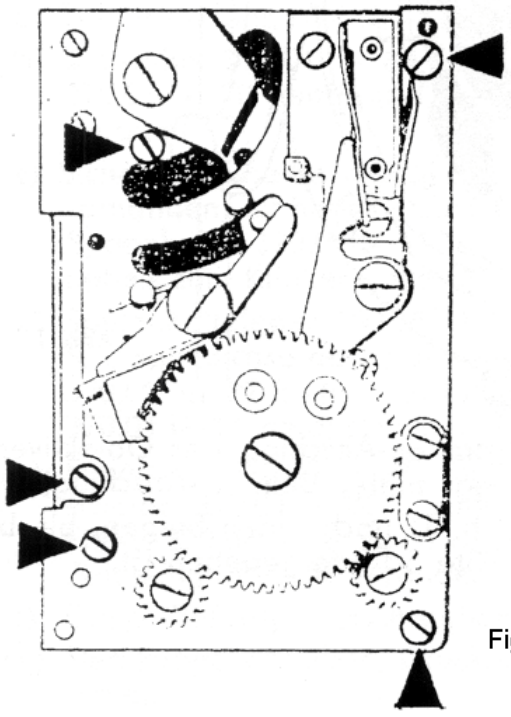


Fig. 2

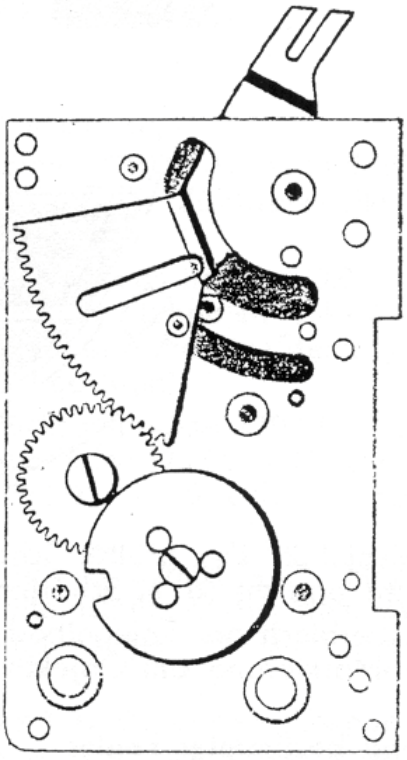


Fig. 3

Note:

For the modified spring spindle version, additionally the lock-spring 370.03-52 on the shutter-plate (right) and the two spring-spindle lock-wheels 370.03-51 (right-hand thread) must be removed.

d) Mark the mesh of the old cocking lever with the intermediate wheel 370.07-19 and the wheel to the cam-disc 370.07 U6 (see Fig 3).

e) Fit the new cocking segment in the marked position. Possibly the cam-disc must subsequently be reset by one tooth.

f) Reattach the shutter-plate to the mechanism (pay attention to the rivet at the bottom of the mirror 370.03 U13 [fits in the slot in the cocking lever]) , and screw the shutter cover-plate back in position.

Note:

For the modified spring spindle version, screw the locking wheels 370.03-51 (right hand thread) on to the spring-spindles, fit the lock-spring 370.03-52, and tension the spring-spindles as described in C. 3. m) – Curtains Unserviceable.

g) Bring the curtain-rods to the marked positions (see also Figs. 7, 9, and 10) and fit and screw down the pinions (as marked) (beforehand turn the shutter-wheels 370.07 U7 and 370.07 U8 towards the left to the firm stop, thereby unlatching the shutter release lever 370.07-11).

h) Cock the shutter. The mirror must go 1mm past the mirror catch lever 370.06 U6. For the mirror to catch, it may be necessary to bend the adjustment lobe on the cocking segment (see Fig 4). If necessary reset cam-disc 370.06 U6 such that the shutter release lever [the catch for the lower shutter wheel] catches when the shutter is tensioned (see Fig. 5).

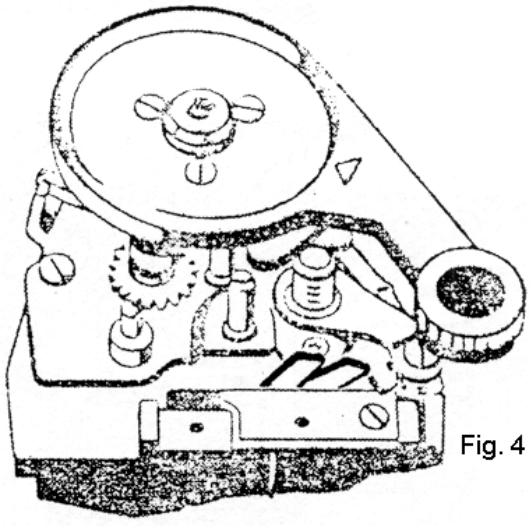


Fig. 4

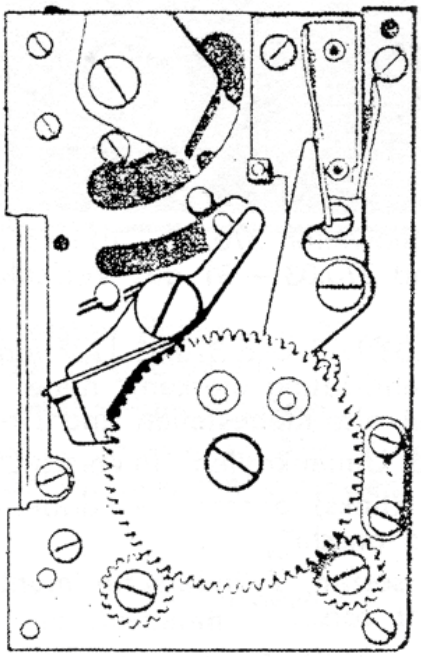


Fig. 5

3. Curtains unserviceable.

Dismantle camera, as under Disassembly of Camera A.1 to A.3.

a) Let the shutter run out.

b) Release the retaining plate for spring-spindles 370.03-25, slacken spring spindles 370.03 U7 (press to the left) and remove the barrel-pin [Zylinderstifte] 0,8h 6x5 DIN 7 from the spring spindles.

Note:

For the modified spring spindle version remove circlips 1.5 DIN 6799 from the spring-spindles, remove the locking-springs 370.03-52 on the shutter-plate (right) 370.07 and the two spring-spindle locking-wheels 370.03-51 (right-hand thread) from the spring-spindles.[Remove locking-springs and slacken locking-wheels before removing circlips]

c) Hold the shutter-wheels 370.07 U7 and 370.07 U8, remove pinions 370.03-27 (one on the left and two on the right) and do not interchange them.

d) Undo the 4 fixing-screws for the shutter plate (left) 370.06 (see Fig. 6) and cover-plate 370.03-23 [3 screws inside on Exa II, 2 on Exa IIb]. If necessary withdraw the large speed adjustment wheel370.06-31 from its 2 flats, having marked its position at the small adjusting wheel 370.04-41 and on the timing cam 370.06-30. Take off the shutter-plate.

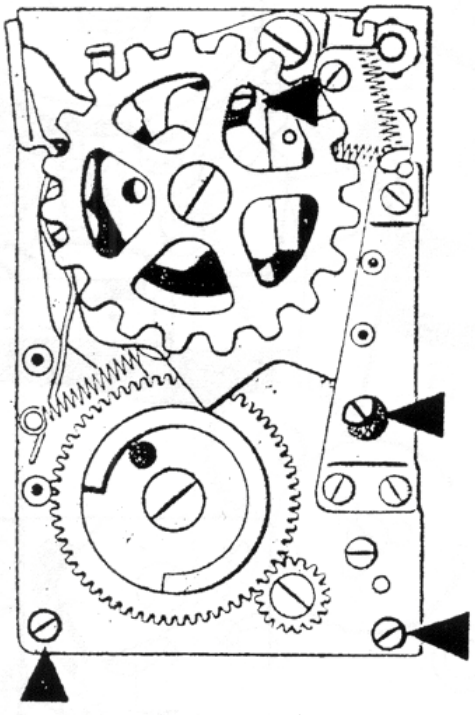


Fig. 6

[Note: lower right screw not there on late model– take out one at 11 o'clock relative to it]

e) Lift out the spring-spindles, curtain spindles 370.03-10 and 370.03-49 as well as redirection spindles 370.03-30 and 370.03-31 from the shutter-plate (right) 370.07.

f) Remove the old curtains 370.03 U5 and 370.03 U9 from their spindles (noting the attachment points and the direction of rotation), and attach the new curtains to the spindles, following the old attachment points and direction of rotation.

g) Insert the curtain spindles and redirection spindles in the shutter-plate (right).

h) Add the shutter-plate (left) – in the process inserting the curtain spindles and redirection spindles – and screw on.

i) Insert the spring-spindles, fit the barrel-pin, screw on the retaining-plate and lightly tension the curtains.

Note:

For the modified spring-spindle version fit the circlips 1.5 DIN 6799 on the spring-spindles, locking-springs 370.03-52 on the shutter-plate (right) 370.07, and the two spring-spindle locking wheels 370.03-51 (right-hand thread) on the spring-spindles.

j) Turn and hold the lower shutter-wheel 370.07 U7 to the left to the firm stop (the sprung flash-contact lever 370.07-8 must in the process be passed).

k) Turn the curtain spindle for the first curtain to the left [?] till the curtain rod comes to stand as illustrated in Fig. 7. In this position fit its pinion and screw together.

l) Turn the curtain spindle for the second curtain to the left [?] till the curtain rod for the second curtain comes to stand under the curtain rod for the first curtain (pay attention to guard/cover/screen [?Deckung?]). In this position fit its pinion and screw together.

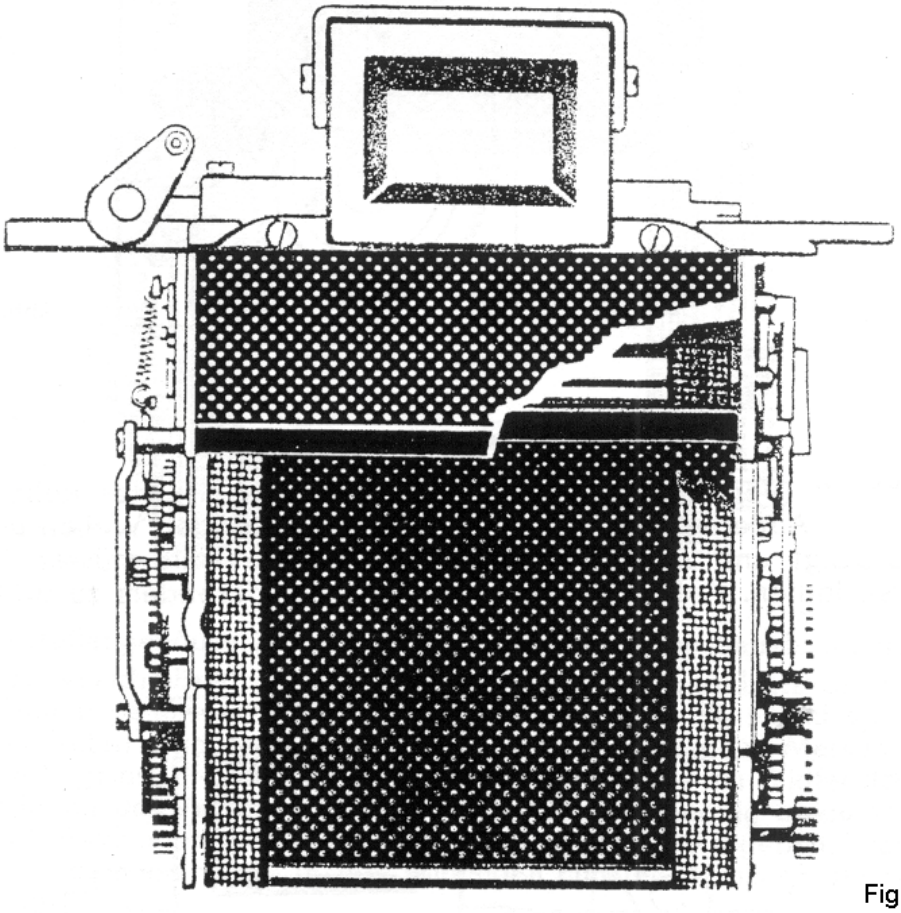


Fig. 7

m) Set the spring-spindle tension for the first curtain to 30 g and the spring-spindle tension for the second curtain to 39 g.

n) Cock the shutter (½ sec must be set).

o) Fit and screw on the pinion for the delay-wheel 370.065-35, as illustrated in Fig. 8 (if necessary transpose the pinion at the flats on the spindle, as the number of teeth is odd).

p) Check for correct functioning.

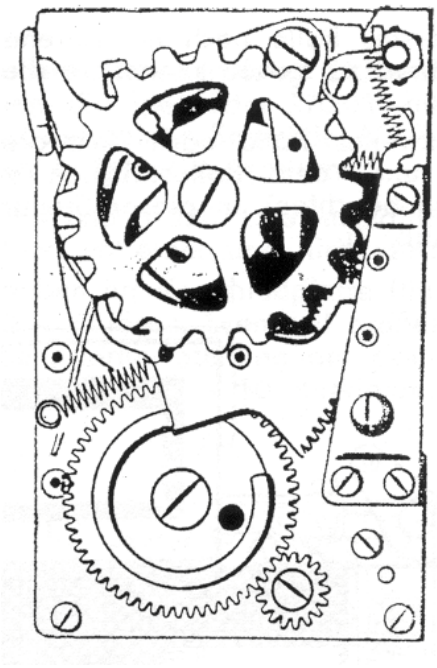


Fig. 8

4. Shutter times checking and adjusting.

Dismantle camera, as under Disassembly of Camera A.1 to A.3 and eliminate fault C.3.

For shutter adjustment only it is not necessary to remove the top cover 370.01 U2.

a) The curtains 370.03 U5 and 370.03 U9 must be arranged as described in Elimination of Certain Faults C.3, Curtains unserviceable (see Fig.7). This rule must be observed, since the uniformity of the operation of the shutter is to a large extent dependent on it. Curtains arranged thus appear as in Fig. 9 (shutter cocked) and Fig.10 (leading curtain up). In

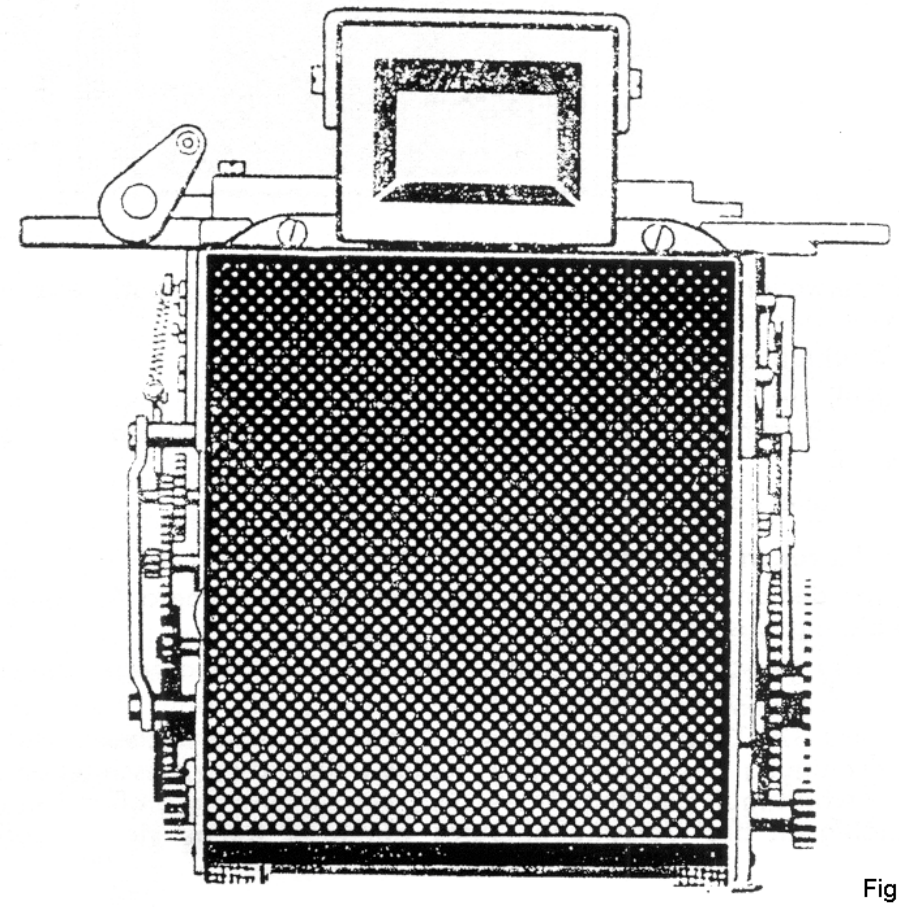


Fig. 9

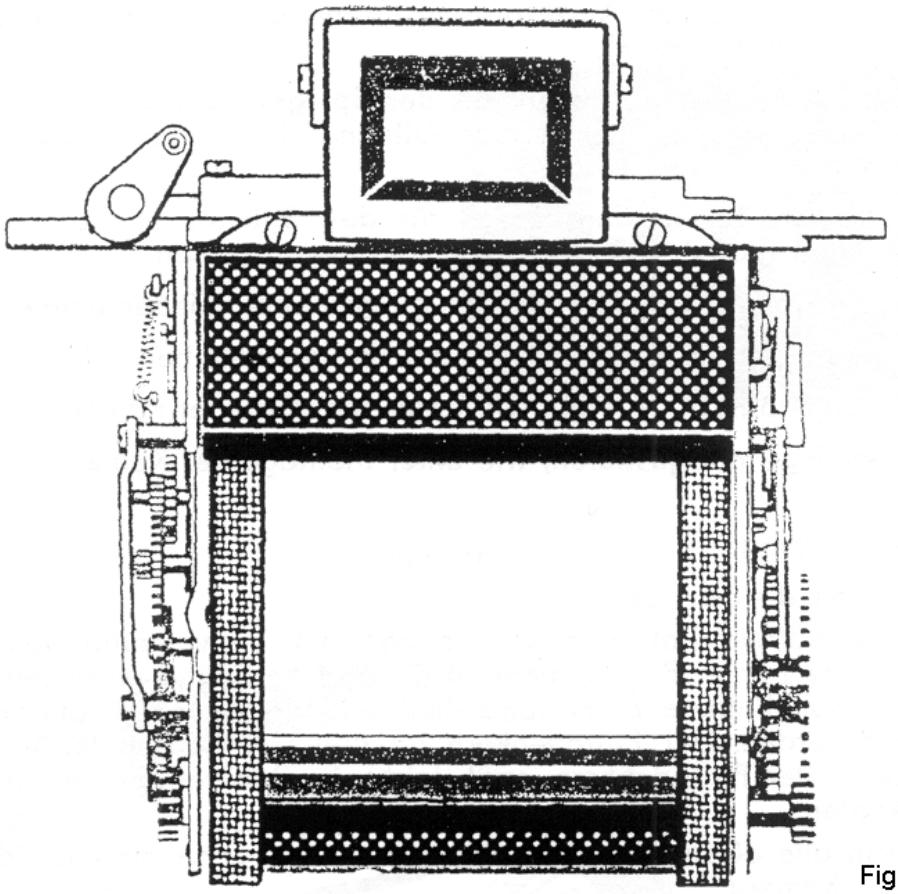


Fig. 10

addition all associated wheels, spindles, and segments must be clean and freshly lubricated.(All these points must slide or run easily. Pay particular attention to the delay mechanism).

b) Place the mechanism in the casing and retain it with two screws.

c) Check the shutter with the shutter-speed measuring equipment. Fundamentally it is only three basic times which are measured, adjusted, and ensured [zwar?], 1/250s, 1/30s, and 1/2s. The other times are obtained through the cam-plate. The measurement at 1/250s is carried out at three points – the beginning, the centre, and the end – in the direction of movement of the shutter-curtains in the film window. The shutter must operate uniformly, i.e. the three measurements must give approximately the same values. This is achieved as described in the following points, d) to g).

d) Spring-spindles 370.03 U7 must have the previously specified tension [specified in Point 3, Curtains Unserviceable].

e) 1/30s adjustment Check shutter-time.
Example 1: 1/30s too light [i.e. time too slow]. Increase the spring-spindle tension for the second curtain (this curtain is connected with the delay wheel 370.06-35).

f) 1/250s adjustment. Check shutter time.
Example 2: 1/250s too light [i.e. time too long]. Reduce the spring-spindle tension for the first curtain.
Example 3: 1/250s too dark [i.e. time too short]. Increase the spring-spindle tension for the first curtain.

g) 1/2s and the other slow times (1/15s to 1/2s) are basically only adjusted with the delay mechanism by means of changing the pallet lever [if lever too short – i.e. time fast] or a shortening of the lever end [if time too slow].

5. Mirror 370.01-33 replacement.

a) Take off the back 370.10, and release the shutter.

b) Lay the camera front side uppermost.

c) Remove the 4 fixing screws M 1.7 x 5 DIN 63 for the lens flange 300.21 U6, and take off the flange (be careful with the shims 300.21-52/1, if fitted).

d) Cock the shutter partly, until the mirror base 370.03 U13 stands at the height of the gap in the round opening in the casing.

e) Bend outwards both the retaining tabs at the front of the mirror base (left and right) for the mirror. Slide the mirror out.

f) Insert the new mirror and bend the retaining tabs back inwards.

g) Replace the lens mount (paying attention to any shims fitted).

h) Check/adjust the lens mount to film path distance, see under assembly of camera B3 and B4.

i) Check/adjust the mirror position, see under assembly of camera B3 and B4.

6. Transport fails.

NB. Only use a faultless cartridge! When spools for daylight loading are used, these may only be inserted in cassette cases of the same manufacturer. With film transport from cassette to cassette, special attention must be paid to the wind-on cassette. If necessary the sliding surface of the spool may be lightly rubbed with paraffin. The spool must slide easily into the case and must not be at an angle.

All these points being in order, the checking of the camera can begin.

Checking the friction-bush 370.03 U11:

a) Remove the rear cover 370.10 and the take-up spool 370.09.

b) Hold the friction bush with the left hand, and at the same time slowly cock the shutter. The friction bush must give uniform resistance and not scrape, catch or run very much out of true.

c) A faulty friction bush is to be removed, cleaned and re-lubricated.

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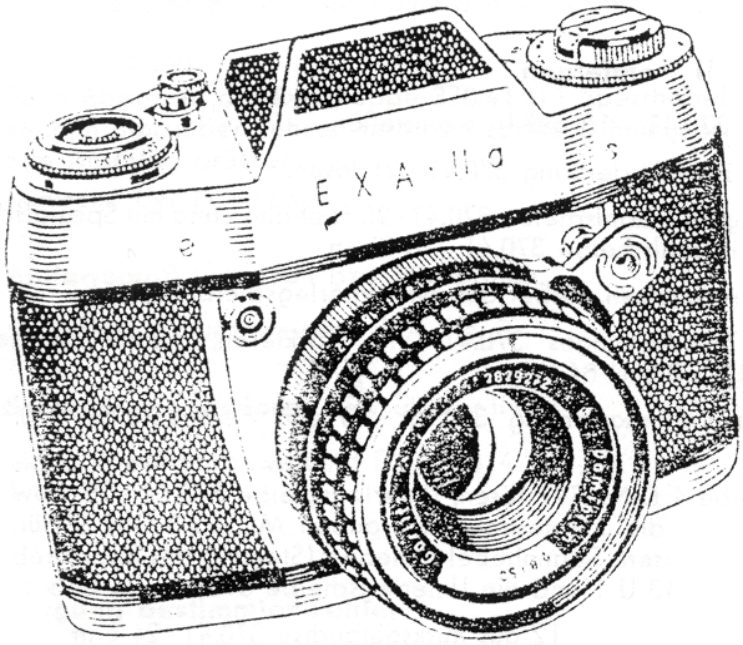
EXA·IIa



Repair Manual

EXA IIa Repair Manual.

Basic Remarks:

The camera under repair is placed with the lens mount 300.21 U 6 to the front, i.e. in the photograph taking direction.

Right: Side with wind-lever 370.41 U6.

Left: Side with time-setting ring 370.41-18.

All screws and nuts have right-hand threads. Never use force! All screws secured with lacquer are to be so secured on assembly.

A. Disassembly of camera.

1. Take off the back cover 370.20.

a)Remove the take-up spool 370.09.

2. Remove the top-plate 370.41 U1.

a) Set the time-setting ring 370.41-18 to ½ sec.

b) With the special tool undo the cover ring 370.41-21 [means the index ring on the right – use a friction tool].

c) Hold the frame-counter disc 370.41-25 with the special tongues and undo the screw for the frame-counter disc 370.41-28 with the special tool.

d) Take off the film-counter disc, as well as any shims that may be fitted.

e) Mark the position of the inter-ring 370.41-20 [the ring retaining the film-speed reminder], and undo the three flat-head [cheese-head?] screws M1.4 x 2 DIN 84.

f) Take off the inter-ring with the film-type ring 370.41-20 and the spring shim 370.41-27.

g) Remove circlip 4 DIN 6799, shim 370.01-79 (as many as present), and the 3 fixing screws M1.4 x 3 DIN 63 for the wind-lever 750-005.00. Withdraw the wind-lever (Note the position of the wind-lever relative to the Schaltsegment 370.43 U1 [the turning part on the camera] and the shim 370.41-26).

h) Remove the spool-retaining spring 300.15 U 12 from the rewind sleeve 370.41-24, and unscrew the sleeve[centre screw] (pay attention to compression spring 370.01-90, shim 370.01-87/2 and spacer 370.01-69). Pull out the rewind spindle370.41 U4.

i) Remove the circlip 370.04-48 for the time-setting disc 370.41-18, and the spring washer 370.04-45. Loosen the time setting disc from the flat on its bush 370.41 U7 and withdraw it (press against the bush in order that the mesh of the gear teeth should not be altered).

j) Pull off the shutter-lock lever 370.41-40 or shutter-lock knob 370.41-31.

k) Undo the 4 fixing screws 350.21-32 for the top-plate.

l) Take off the top-plate.

m) Fit again the wind-lever with 3 screws, shim and circlip.

n) Mark the position of the time-setting wheel (gear-wheel on sleeve 370.04 U7) on the mechanism [mark the mesh of the gears?] and refit the time-setting disc.

3. Removal of mechanism 370.43.

a) Remove the 2 screws M1.7x8 DIN 84 in each film chamber.

b) Lift out the mechanism from the body-shell 370.48.

B. Assembly of camera.

1. Insertion of mechanism 370.43.

As under Disassembly of Camera A3 but in reverse order, engaging with the pinion on the sprocket-spindle 370.41-22. Check for correct functioning (including flash contact).

2. Fitting the top-plate 370.41 U1.

As under Disassembly of Camera A2 but in reverse order.

NB:

When putting on the top-cover 370.41 U1, with the aid of a small screwdriver through the right top-cover opening, press the lock-lever 370.44-17 leftwards to the stop [means the rewind button lever, I think].

Check for correct functioning.

3. Check and adjust the distance between the lens mount and the film plane.

See Repair Manual for EXA II B.3.

4. Check and adjust the mirror.

See Repair Manual for EXA II B.4.

C. Elimination of certain faults.

1. Cocking segment 370.07 U5 is damaged.

See Repair Manual for EXA II C.2.

2. Curtains unserviceable.

See Repair Manual for EXA II C.3.

3. Shutter times checking and adjusting.

See Repair Manual for EXA II C.4.

4. Mirror 370.01-33 replacement.

See Repair Manual for EXA II C.5.

5. Transport fails.

See Repair Manual for EXA I.

6. Frame-counter adjusting (see Fig 1).

Dismantle camera, see under disassembly of camera A.1. to A.3.

a) Cock and fire the shutter several times, while watching the frame-counter pawl 370.44-7, the frame-counter latch 370.44-20, and the frame-counter wheel 370.44-24 on the underside of the intermediate plate 370.44 U 9.

   On the return of the wind-lever 370.41 U 6, the frame-counter pawl must push the frame-counter wheel forward by one tooth, and the frame-counter latch must drop into the next tooth of the frame-counter wheel.

b) If this is not the case, then the stroke of the frame-counter catch must be altered as necessary by bending adjustment tab A. The bending must be done with caution!

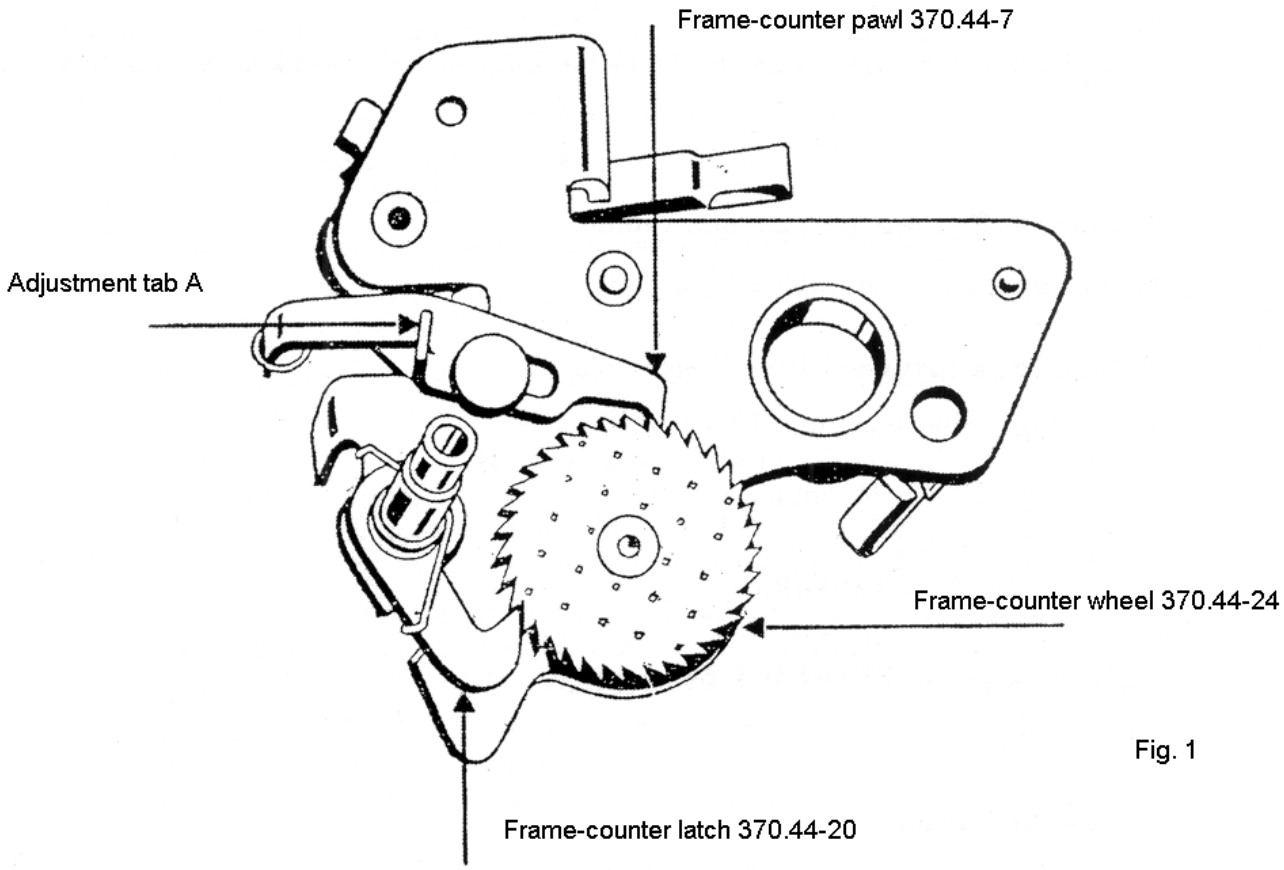


Fig. 1

c) Reassemble the camera, see Disassembly of camera A. 1. to A. 4. but in reverse order.

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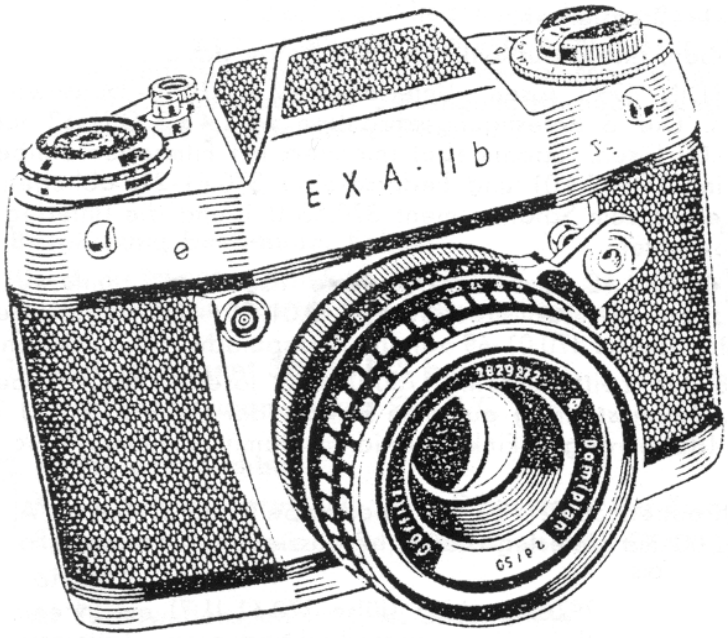
EXA·IIb



Repair Manual

EXA IIb Repair Manual.

Basic Remarks:

The camera under repair is placed with the lens mount 300.21 U 6 to the front, i.e. in the photograph taking direction.

Right: Side with wind-lever 750-714.00.

Left: Side with time-setting ring 370.41-18.

All screws and nuts have right-hand threads. Never use force! All screws secured with lacquer are to be so secured on assembly.

A. Disassembly of camera.

1. Take off the back cover 370.20.

a) Remove the take-up spool 370.09.

2. Remove the top-plate 370.51 U1.

a) Set the time-setting ring 370.41-18 to ½ sec.

b) Remove glued-in cover disc (black) 750-000.37 (note position of index mark).

c) Hold the frame-counter disc 370.41-25 and with the special tool remove the screw 370.41-42 for the frame-counter disc.

d) Withdraw the frame-counter disc, noting any washers.

e) Remove circlip 4 DIN 6799, and take off shim 370.01-79 (as many as present). Unscrew the 3 fixing screws M1.4 x 3 DIN 63 for the wind-lever 750-714.00. Take off the wind-lever (complete with film-type ring 750-713.02, cover-ring 750-713.01 and spring shim 370.41-27). Note the position of the wind-lever relative to the Schaltsegment 370.53 U 1 [the turning part on the camera] and the shim 750-713.04.

f) Remove the spool-retaining spring 300.15 U 12 from the rewind sleeve 750-000.02, and unscrew the sleeve[centre screw] (pay attention to compression spring 370.01-90, shim 370.01-87/2 and spacer 370.01-69). Pull out the rewind spindle.

g) Remove the circlip 370.04-48 for the time-setting disc 750-004.00, and the spring washer 370.04-45. Loosen the time setting disc from the flat on its bush 370.41 U 7 and withdraw it (press against the bush in order that the mesh of the gear teeth should not be altered).

h) Undo the 4 fixing screws 350.21-32 for the top-plate, withdraw the lever for the shutter lock 750-012.00 with shim, and take off the top-plate.

i) Mark the position of the time-setting wheel (gear-wheel on sleeve 370.04 U7) on the mechanism [??why – better mark mesh of gears??] and the position of both time-setting gears relative to each other. Refit the time-setting disc.

j) Fit again the wind-lever with 3 screws, shim and circlip.

3. Removal of mechanism 370.53.

a) Remove the 2 screws M1.7x8 DIN 84 in each film chamber.

b) Lift out the mechanism from the body-shell 370.48.

B. Assembly of camera.

1. Insertion of mechanism 370.53.

As under Disassembly of Camera A3 but in reverse order, engaging with the pinion on the sprocket-spindle 370.51-4. Check for correct functioning (including flash contact).

2. Fitting the top-plate 370.51 U 1.

As under Disassembly of Camera A2 but in reverse order.

NB:

When putting on the top-cover 370.51 U 1, with the aid of a small screwdriver through the right top-cover opening, press the lock-lever 370.44-18 leftwards to the stop [means the rewind button lever, I think]. Check for correct functioning.

3. Check and adjust the distance between the lens mount and the film plane.

See Repair Manual for EXA II B.3.

4. Check and adjust the mirror position.

(Collimator is set to infinity).

a) Example 1:
The greatest sharpness lies before the infinity stop of the lens: Slacken slightly the fixing screw for the mirror adjusting eccentric 370.53-4 and turn the eccentric clockwise until the best focus is obtained at the infinity mark of the lens. Re-tighten the fixing screw and secure [i.e. lacquer]. Check the focus again.

b) Example 2:
The greatest sharpness is not yet obtained at the infinity stop of the lens (ie. the point of sharpest focus would lie beyond the infinity stop): Slacken slightly the fixing screw for the mirror adjusting eccentric 370.53-4 and turn the eccentric anti-clockwise until the best focus is obtained at the infinity mark of the lens. Re-tighten the fixing screw and secure. Check the focus again.

C. Elimination of certain faults.

(As a result of the development of the Exa II/IIa to the Exa IIb minor deviations in different elements arise.).

1. Cocking segment 370.57 U2 is damaged.

See Repair Manual for EXA II C. 2.

2. Curtains unserviceable.

Dismantle camera, as under Disassembly of Camera A. 1. to A. 3.

For repair procedure, see Repair Manual for EXA II C. 3.

a) to l).

m) Set the spring-spindle tension for the first curtain to 35 g and the spring-spindle tension for the second curtain to 55 g.

n) Cock the shutter (½ sec must be set).

o) Turn the delay wheel 370.56 U 6 with delay collar 370.56-12 clockwise, until the mirror falls to the 45º position.

p) Turn the delay wheel anti-clockwise, until pinion 370.56 U 3 is arrested by the lock-lever for pinion 370.56-16.

q) Fit the pinion for the delay-wheel 370.03-27, as shown in Fig. 8 (Repair Manual for EXA II), fit screw and secure [lacquer?]. It is to be noted that when inserting the pinion the delay-wheel in the basic position may not possibly be changed (if necessary turn the pinion over, there are an odd number of teeth).

r) Check for correct functioning.

3. Shutter times checking and adjusting.

See Repair Manual for EXA II C. 4.

4. Mirror 370.51-2 replacement.

a) Take off the back, and remove the spool.

b) Lay the camera front side uppermost.

c) Remove the 4 fixing screws M 1.7 x 5 DIN 63 for the lens flange 300.21 U 6, and take off the flange (be careful with the shims 300.21-52/1, if fitted).

d) Move the mirror base 370.54 U 1 to the height of the gap in the round hole in the outer shell.

e) Bend outwards both the retaining tabs at the front of the mirror base (left and right) for the mirror. Slide the mirror out.

f) Insert the new mirror and bend the retaining tabs back inwards.

g) Replace the lens mount (paying attention to any shims fitted).

h) Check/adjust the lens mount to film path distance.
See Repair Manual for EXA II B. 3.

i) Check/adjust the mirror position.
As under Assembly of Camera B. 4.

5. Transport fails.

See Repair Manual for EXA I C. 6.

6. Frame-counter adjusting.

See Repair Manual for EXA IIa C. 6.

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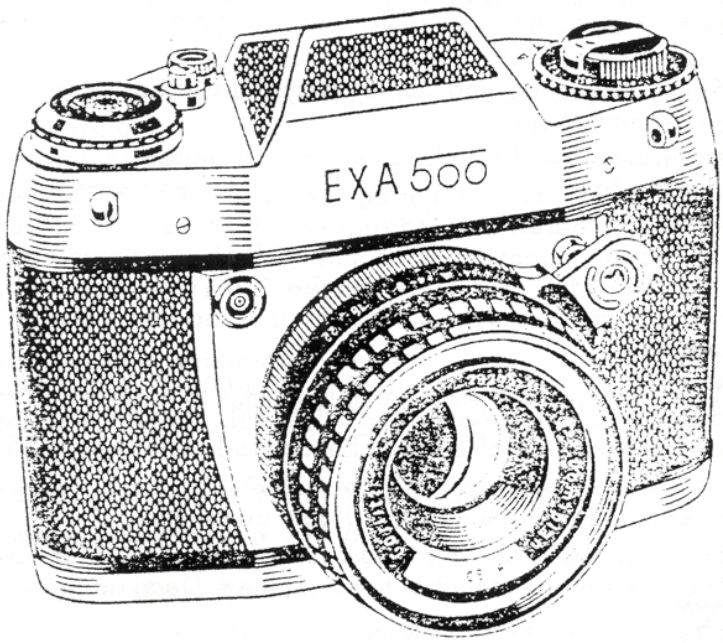
EXA 500



Repair Manual

EXA 500 Repair Manual.

Basic Remarks:

The camera under repair is placed with the lens mount 300.21 U 6 to the front, i.e. in the photograph taking direction.

Right: Side with wind-lever 370.63 U 7.

Left: Side with time-setting ring 370.61 U 4 with Hülse [?].

All screws and nuts have right-hand threads. Never use force! All screws secured with lacquer are to be so secured on assembly.

A. Disassembly of camera.

1. Take off the back cover 370.20.

a) Remove the take-up spool 370.09.

2. Remove the top-plate 370.61 U1.

a) Set the time-setting ring to ½ sec.

b) Remove glued-in cover disc (black) 750-000.37 (note position of index mark).

c) Hold the frame-counter disc 370.41-25 and with the special tool remove the screw 370.41-42 for the frame-counter disc.

d) Withdraw the frame-counter disc, noting any washers.

e) Remove circlip 4 DIN 6799, and take off shim 370.01-79 (as many as present). Unscrew the 3 fixing screws M1.4 x 3 DIN 63 for the wind-lever 370.63 U 7. Take off the wind-lever (complete with film-type ring 750-713.02, cover-ring 750-713.01 and spring shim 370.41-27). Note the position of the wind-lever relative to the Schaltsegment 370.53 U 1 [the turning part on the camera] and the shim 750-713.04.

f) Remove the spool-retaining spring 300.15 U 12 from the rewind sleeve 750-000.02, and unscrew the sleeve[centre screw] (pay attention to compression spring 370.01-90, shim 370.01-87/2 and spacer 370.01-69). Pull out the rewind spindle.

g) Remove the circlip 370.04-48 for the time-setting disc with sleeve 370.61 U 4, and the spring washer 370.04-45. Remove the time-setting disc with sleeve.

h) Undo the 4 fixing screws 350.21-32 for the top-plate, withdraw the lever for the shutter lock 750-012.00 with shim, and take off the top-plate.

i) Fit again the wind-lever with 3 screws, shim and circlip.

3. Removal of mechanism 370.63.

a) Remove the 2 screws M1.7x8 DIN 84 in each film chamber.

b) Lift out the mechanism from the body-shell 370.48.

B. Assembly of camera.

1. Insertion of mechanism 370.63.

As under Disassembly of Camera A3 but in reverse order, engaging with the pinion on the sprocket-spindle 370.51-4. Check for correct functioning (including flash contact).

2. Fitting the top-plate 370.61 U 1.

As under Disassembly of Camera A2 but in reverse order.

NB:

When putting on the top-cover 370.61 U 1, with the aid of a small screwdriver through the right top-cover opening, press the lock-lever 370.44-18 leftwards to the stop [means the rewind button lever, I think]. Check for correct functioning.

3. Check and adjust the distance between the lens mount and the film plane.

See Repair Manual for EXA II B.3.

4. Check and adjust the mirror position.

(Collimator is set to infinity).

a) Example 1:
The greatest sharpness lies before the infinity stop of the lens: Slacken slightly the fixing screw for the mirror adjusting eccentric 370.53-4 and turn the eccentric clockwise until the best focus is obtained at the infinity mark of the lens. Re-tighten the fixing screw and secure [i.e. lacquer]. Check the focus again.

b) Example 2:
The greatest sharpness is not yet obtained at the infinity stop of the lens (ie. the point of sharpest focus would lie beyond the infinity stop): Slacken slightly the fixing screw for the mirror adjusting eccentric 370.53-4 and turn the eccentric anti-clockwise until the best focus is obtained at the infinity mark of the lens. Re-tighten the fixing screw and secure. Check the focus again.

C. Elimination of certain faults.

(As a result of the development of the Exa II/IIa/IIb to the Exa 500 minor deviations in different elements arise.).

1. Cocking segment 370.57 U2 is damaged.

See Repair Manual for EXA II C. 2.

2. Curtains unserviceable.

Dismantle camera, as under Disassembly of Camera A. 1. to A. 3.

For repair procedure, see Repair Manual for EXA II C. 3.

a) to l).

m) Set the spring-spindle tension for the first curtain to 35 g and the spring-spindle tension for the second curtain to 75 g.

n) Cock the shutter (½ sec must be set).

o) Turn the delay wheel 370.56 U 6 with delay collar 370.56-12 clockwise, until the mirror falls to the 45º position.

p) Turn the delay wheel anti-clockwise, until pinion 370.56 U 3 is arrested by the lock-lever for pinion 370.56-16.

q) Fit the pinion for the delay-wheel 370.03-27, as shown in Fig. 8 (Repair Manual for EXA II), fit screw and secure [lacquer?]. It is to be noted that when inserting the pinion the delay-wheel in the basic position may not possibly be changed (if necessary turn the pinion, there are an odd number of teeth).

r) Check for correct functioning.

3. Shutter times checking and adjusting.

Dismantle camera, as under Disassembly of Camera A. 1. to A. 3.

For repair procedure, see Repair Manual for EXA II C. 4.

a) to g) [should this read “a) to b)” ?]

At the following points deviations arise in the case of the EXA 500:

`c) Check the shutter with the shutter-speed measuring equipment. Fundamentally it is only three basic times which are measured, adjusted, and ensured [zwar?], 1/500 s, 1/60 s, and 1/2 s. The other times are obtained through the cam-plate. The measurement at 1/500 s is carried out at three points – the beginning, the centre, and the end – in the direction of movement of the shutter-curtains in the film window 2mm away from the upper and/or lower film-window edge. The shutter must operate uniformly, i.e. the three measurements must give approximately the same values (see table for exposure times of EXA II/IIa/IIb/500).

This is achieved as described in the following points, d) to g).

d) Spring-spindles 370.03 U7 must have the previously specified tension.

e) 1/60 s adjustment Check shutter-time.
Example 1: 1/60 too light. Slacken the spring for the delay segment 370.06-40.
Example 2: 1/60 too dark. Tighten the spring for the delay segment.

f) 1/500 s adjustment Check shutter-time.
Example 3: 1/500 s too light.. Reduce the spring-spindle tension for the first curtain.
Example 4: 1/500 s too dark. Increase the spring-spindle tension for the first curtain.

g) 1/2s and the other slow times (1/30 s to 1/2 s) are basically only adjusted with the delay mechanism by means of a change/modification of the pallet lever.

4. Mirror 370.51-2 replacement.

a) Take off the back, and remove the spool.

b) Lay the camera front side uppermost.

c) Remove the 4 fixing screws M 1.7 x 5 DIN 63 for the lens flange 300.21 U 6, and take off the flange (be careful with the shims 300.21-52/1, if fitted).

d) Move the mirror base 370.54 U 1 to the height of the gap in the round hole in the outer shell.

e) Bend outwards both the retaining tabs at the front of the mirror base (left and right) for the mirror. Slide the mirror out.

f) Insert the new mirror and bend the retaining tabs back inwards.

g) Replace the lens mount (paying attention to any shims fitted).

h) Check/adjust the lens mount to film path distance. See Repair Manual for EXA II B. 3.

i) Check/adjust the mirror position. As under Assembly of Camera B. 4.

5. Transport fails.

See Repair Manual for EXA I C. 6.

6. Frame-counter adjusting.

See Repair Manual for EXA IIa C. 6.

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Exposure times for EXA II, -IIa, -IIb, -500

Nominal value	Rated value	Exposure times	
		Lower limit	Upper limit
sec	ms		
1/500	1.95	1.43	2.67
1/250	3.91	2.86	5.33
1/125	7.81	6.35	9.62
1/60	15.63	12.69	19.23
1/60*)	18.5	16	19.23
1/30	31.3	25.4	38.5
1/15	62.5	50.8	76.9
1/8	125	102	154
1/4	250	203	308
1/2	500	406	616

*) Only valid for EXA 500. Design dependent tolerance limit.

The quotient average [ratio?] of three measurements at two adjacent time settings must amount to at least 1.4 and at most 2.8.

The ratio of largest and smallest exposure times within one shutter run at the three measuring points (Ungleichmäßigkeitsgrad [tapering?]) must not exceed 1.5.

The specified values comply with Standard TGL 7708 as well as the definition according to DIN 19016.

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